SYSTEM TRAINING PLAN
(STRAP)

FOR THE

AVENGER

TRADOC APPROVED: **12 April, 1999**
U.S. ARMY AIR DEFENSE ARTILLERY SCHOOL
DIRECTORATE OF TACTICS, TRAINING AND DOCTRINE
FORT BLISS, TEXAS 79916-3802

SYSTEM TRAINING PLAN
(STRAP)

FOR THE

AVENGER WEAPON SYSTEM

SYSTEM TRAINING PLAN

FOR

AVENGER

1. SYSTEM DESCRIPTION

a. Narrative

The Avenger is a lightweight, day/night, and limited adverse weather fire unit for countering the threat of low altitude Unmanned Aerial Vehicles (UAV), Cruise Missiles (CM), fixed wing or rotary wing aircraft. The Avenger fire unit consists of two turret-mounted missile pods, a M3P 50 caliber machine gun, Forward Looking Infrared (FLIR) system, laser range finder, heater/ventilator, two auto-track systems and identification Friend or Foe (IFF) system. The fully rotating, gyro-stabilized turret is mounted on the High-Mobility Multipurpose Wheeled Vehicle (HMMWV). The fire unit can engage a target with missile or machine-gun while on the move or from a stationary position with a gunner in the turret or from a remote location using the Remote Control Unit (RCU). On board communications equipment provides for radio and intercom operation. The Avenger is fielded to all Active Component (AC) divisional Air Defense Artillery units and ACRs. It is also fielded to ARNG Corps and EAC Battalions.

The Avenger is scheduled for a major modification that will add Slew-to-Cue (STC) capabilities beginning 1st Qtr FY00. The STC is a significant upgrade to the existing Avenger weapon system. Using STC, the Avenger will be able to accept digital early warning data and automatically slew the turret in both azimuth and elevation, centering the target in the gunner's field of view. Targeting data is provided by Forward Area Air Defense (FAAD) Command, Control, Communications and Intelligence (C3I). The FAAD C3I equipment provides early warning/alerting, a complete air picture, slew-to-cue and target IFF information. This improvement not only improves the efficiency and effectiveness of the Avenger, but also allows it to kill the broadening spectrum of 21st century threats, including CMs and UAVs. With STC, the Force XXI air defense soldier is more effective, more efficient, and more lethal. For additional information on STC, refer to its Operational Needs Statement.

b. First Unit Equipped (FUE)

Date: April 1989

c. Proposed First Unit Equipped for STC:

1st Qtr FY 00 – 4ID

2. TARGET AUDIENCE

USAADASCH has an established training base to support the Avenger system. Institutional training consists primarily of entry level 14S-crew member training. SHORAD commissioned officers (14B) attend a basic (common core) track and advanced courses. Warrant officers (917A) attend their basic and advanced courses at USAOMMCS. Maintenance personnel are trained by their supporting institutions. The following is a list of MOSs supporting the Avenger system:

- 14S Avenger Crew Member

- 27T Avenger System Repairer
- 63B Light Wheel Vehicle Mechanic
- 917A *MFAD DS/GS Maintenance Technician
  ***917A merges into 918D Electronics Missile Maintenance Technician effective 1QFY00**
- 14B Air Defense Artillery SHORAD Officer

3. ASSUMPTIONS

- Resources, personnel, and equipment required to support the programs of instruction for Avenger will be absorbed within current funding levels.
- There will not be an increase in total Army force structure to support the manning of Avenger.
- As needs are determined, new training devices will be acquired in a timely manner.
- Training development resources, manpower, and equipment will be available to support the Avenger system over the life cycle of the system.
- Existing, required Training Aids, Devices, Simulations, and Simulators (TADSS) will be developed and fielded as soon as technically and economically feasible.
- Avenger system associated TADSS and associated training material (Lesson Plans, IMI, etc.) will be provided to the units concurrent with system fielding schedules per CSA directives.
- NET will be provided as system improvements are made (e.g. STC, Environmental Control Unit (ECU), Power Production Unit (PPU).
- Required modifications to existing TADSS (i.e. Institutional Conduct of Fire Trainer (ICOFT) and TableTop Trainer (TTT)) for STC and future modifications will be developed and fielded with the systems.

4. TRAINING CONSTRAINTS

- Training for the AVENGER system will be developed in accordance with TRADOC Regulation 350-70, Training Development Management, Processes, and Products, and within the framework of the materiel acquisition process (DOD 5000.2R).
- Personnel resources for AVENGER system training must be absorbed within current resource levels. The training equipment, components, and devices must be provided in sufficient quantities and within the appropriate time frames to support operational testing and system fielding. Required resources defined in this System training Plan (STRAP) will be funded and/or provided by the Training and Doctrine Command (TRADOC)/AVENGER system Project Office.

- The limited availability of Stinger rounds and live-fire limitations greatly impacts their use in training and qualification. Therefore, a heavy reliance is placed on the use of TADSS for both training and qualification. Without the required TADSS and associated targets for aerial gunnery, training and ultimately readiness will suffer.

- Due to OPTEMPO, cost, and characteristics and limited availability of ranges for Combined Arms maneuver training, a virtual solution is necessary to perform this required training. Without the inclusion of Air Defense fire units in Combined Arms Tactical Training, the training and effectiveness of all branches will suffer.

5. TRAINING CONCEPT (AC/RC)

a. New Equipment Training (NET) Concept

All training will be IAW AR 350-35, Army Modernization Training (AMT). AMT ensures an orderly transfer of knowledge on the operation and maintenance of equipment from the Material Developer (MATDEV) or provider to the tester, trainer, supporter, and user. AMT includes New Equipment Training (NET), Doctrine and Tactics Training (DTT), and Sustainment Training (ST). AMT requirements are the responsibility of the MATDEV and will be coordinated with USAADASCH, as the Combat Developer (CBTDEV)/Training Developer (TNGDEV), and other supported schools. In the development of training, NET planners will consider institutional training, Exportable training (to include Interactive Multimedia Instruction (IMI) and other forms of Distance Learning (DL), Leader training, Key Personnel training, Organizational training, and Total Unit training. It is envisioned that initial Avenger fieldings will require a full, formal, contractor NET. For follow-on NET for major system modifications (such as STC), developers will consider train-the-trainer training, single-site training, contractor NET Teams (NETT), and, if effective and affordable, Army staffed NETT.

b. Institutional Training Concept

The US Army Air Defense Artillery School (USAADASCH) is the proponent for the 14S Avenger operator institutional training. The training concept builds on the existing Avenger POI and prepares the air defense soldier to qualify as a skill level one 14S-crew member through completion of Advanced Individual Training (AIT) at Fort Bliss, Texas. In order to ensure accurate, cost-effective training occurs, the material developer must continue to provide and upgrade institutional TADSS as system modifications are made (i.e. STC). The combination of institutional and unit training strategies as outlined in the 14S Soldier Training Publication completes the training mix that is designed to prepare the 14S for each level of progression. After completion of AIT, NET, and unit Sustainment training, the soldier is capable of performing respective skill level tasks to standard.

USAADASCH Officer's Basic and Advanced Courses (OBC/OAC/WOAC) include instruction on the Avenger system and prepare Air Defense officers to perform as SHORAD leaders. All Avenger associated training and training products prepare the ADA leader, soldier, and unit to execute force protection operations in the combined arms arena.

Avenger impacts the training bases of the Quartermaster Center & School (USAQC&SCH) and the Ordnance Missile and Munitions Center and School (USAOMMCS). Those proponents will share responsibility for 63B (vehicle chassis) and 27T (missile system) maintainer training. 917A MFAD Technical Warrant Officer training is conducted at USAOMMCS. The training of direct and general

support maintainers will consist of initial entry training at their respective institutions through the use of lesson materials, NET, TADSS, and IMI training support products provided by the material developer.

c. Unit Training Concept

AVENGER training will consist of all three (3) mutually supporting pillars of the Combined Arms Training Strategy (CATS): Unit, Institution, and Self-Development training. CATS provide direction on how the unit will train and identifies the best mix of training resources to actually accomplish the training. The strategy integrates Gunnery, Maneuver Exercises (live and virtual), and Soldier Training, into battle-focused training plans. It's not a rigid process that limits the leader but provides the leader with a menu of training events and resources from which he can plan and manage training to ensure soldiers and units are qualified.

The training of soldiers, leaders, and units shall be tough, realistic, and intellectually and physically challenging. It excites, motivates, and develops competence and confidence and capitalizes on technology by using an array of TADSS that provide the best training efficiency (low cost) and training effectiveness (promotes learning). Actual system equipment will be used to validate the transfer of knowledge and expertise learned through the use of TADSS. Gunnery Tables, Maneuver Exercises (live and virtual), and other training resources can be found in the system training and doctrinal publications.

6. TRAINING STRATEGY (AC/RC)

a. New Equipment Training (NET) Strategy

IAW AR 350-35, the MATDEV will work in conjunction with the TNGDEV to design and publish a new Equipment Training Plan (NETP) that encompasses the total training subsystem. The NETP is a living document and though the Avenger system is considered fielded, the original NETP must be extended and updated or a new NETP established for STC. USAADAS will validate all courses, materials, and products developed. All AVENGER system equipment and the training subsystem with all its devices and products must be available for NET.

The training designed will constitute a complete training subsystem. It will include, but is not limited to, individual and collective task analysis; institutional and unit TADSS; Instructor & Key Personnel Training (I&KPT); formal, contractor NET on site for both system operators and maintainers; and an IMI Training Support Package (TSP). This training will be limited to Avenger-unique (air defense specific, both operator and maintainer) instruction and designed as an exportable multimedia-training package, complete with a digitized POI, lesson plans, technical manuals, student and instructor guides, and a course management plan. The TSP will include a self-taught "how to" tutorial modules covering all aspects of the system and a diagnostic test module that permits identification of soldier training proficiency by module. The TSP will be used during the course of NET and, in addition to other NET materials, will be left with the unit for future NET/Sustainment Training.

Specific NET courses of instruction for the upcoming STC modification will include, I&KP training for the STC components and NET, both of which will cover operations and maintenance. New training requirements, to include new or modified TADSS and TSP development, are limited to STC and ECU/PPU specific air defense training. Prerequisite training for STC I&KP and NET includes Simplified Handheld Terminal Unit (SHTU/HTU), Enhanced Position Location Reporting System (EPLRS), and Global Positioning System (GPS/PLGR) training. Prerequisite training and the system IMI TSP will be supported by and provided through the Avenger Program Manager.

NET is planned for and will be monitored by USAADASCH, USAOMMCS and USAQC&SCH incrementally by battery, for an entire battalion. **Currently the TRADOC Proponent NET Manpower Space allocations authorizes 2 personnel for STC NET for Fiscal Years 99 through 04.** In addition to NET, the following courses will be required:

- Instructor and Key Personnel (I&KP) Course. This course is designed to train TRADOC instructors, New Equipment Training Team (NETT) members, and other key personnel in the training base. Training will be scheduled in such a way that personnel involved will not adversely affect the stability and continuity within the training base. The I&KP training package will be validated prior to the first presentation of I&KP training. The validation by USAADASCH will be based on performance testing and testing of a representative sample of the target audience. Personnel having completed I&KP training should be stabilized in the institution to ensure availability of qualified personnel to train soldiers to maintain the AVENGER system training base.

- Instructor and Key Personnel (I&KP) Support Maintenance Course. This course is designed to train USAOMMCS instructors MOS 27T, New Equipment Training Team (NETT) members, CASCOM training developers, and other key personnel in the training base. The I&KP training package will be validated prior to the first presentation of I&KP training by USAOMMCS, and will be based on performance testing and testing of a representative sample of the target audience. Personnel having completed the I&KP course should be stabilized in the institution to ensure availability of qualified personnel to train soldiers to maintain the AVENGER system training base.

- Reserve Component training will be accomplished in accordance with the USAADASCH, USAOMMCS, and USAQC&SCH Reserve Component (RC) Training Strategies for their respective products.

b. Institutional Training Strategy (Warrior)

Training is developed IAW TRADOC Regulation 350-70 and designed to be safe, battle focused, derived from wartime missions, and based on Avenger/SHORAD doctrine. It will follow the Systems Approach to Training (SAT) process. The institutional training design is based upon the following criteria:

- Instruction is performance-oriented, emphasizes hands-on practical exercises, and prepares SHORAD soldiers and units to achieve and sustain proficiency on individual and collective tasks. Standards are established per the Mission Essential Task List (METL), the Army Training and Evaluation Program (ARTEP), Mission Training Plan (MTP) and Drills, Soldier's Training Publication (STP), and Officer Foundation Standards (OFS).

- Training is designed to be sequential by steps/procedures and will progress through the skill levels. Institutional and unit training programs capitalize on TADSS technology through the use of Institutional Conduct of Fire Trainers (ICOFTS) and other devices that support efficient and effective training. The actual equipment is then saved and used only to validate the transfer of learning from device to system.

- Required training ranges are safe and training effective. Ranges are environmentally nondestructive and are used to train using live-fire and simulated firing.

The US Army Air Defense School (USAADASCH), Fort Bliss, is the proponent for the 14S Avenger crew member institutional training and for the Basic and Advanced officer weapons track training. The Advanced Individual Training (AIT) design is based upon the training concept to prepare entry-level soldier to qualify as a skill level one (SL1) 14S. Listed below are the institutional courses of instruction:

(1) 14S Avenger Crew Member AIT. The US Army Air Defense Artillery School, 6th ADA Brigade conducts 14S AIT. The training is a 10 week program of instruction (POI) to train an initial entry soldier in MOS 14S10 in the following instruction:
- Visual Aircraft recognition.
- Operation and Maintenance of the M998 Series Vehicle, and communication equipment.
- Operation and maintenance of the Stinger weapon system and IFF interrogator programming and PMCS on IFF equipment.
- Operation and maintenance of the Avenger system and machine gun.
- March order and emplacement; target engagement, and hangfire/misfire and dud procedures.

(2) 14B SHORAD Officer Basic (Weapons Track) (OBC) and Officer Advanced Course (OAC). The US Army Air Defense Artillery School, 6th Brigade conducts SHORAD officers' (14B) training. Both the officer's Basic and Advanced courses include Avenger capabilities instruction. The OBC is a 9 week, 4 days weapons track on the operational capabilities on the Avenger system. The OAC incorporates Avenger tactics into the POI small group processes.

(3) 14B-RC SHORAD Officer Reclassification-RC. The US Army Air Defense Artillery School, 6th Brigade conducts SHORAD officers' training. The SHORAD-RC course is designed for reserve component officers with an actual anticipated assignment to a RC SHORAD Air Defense unit. The POI teaches characteristics, capabilities, limitations, and tactics of Avenger and MANPADS systems, with emphasis on the platoon, battery and battalion operations.

Note: STC will allow the Avenger system to make optimal use of the digitized FAAD C3I system in order to maximize Avenger engagement effectiveness. STC will automate the detection, acquisition, and targeting processes of thus achieving a true sensor to shooter capability. 6th Brigade is currently incorporating STC capabilities, characteristics, components, procedures and requirements into all existing Programs of Instruction.

c. Unit Sustainment Training (Warfighter)

The unit commander and unit trainers accomplish the sustainment of individual and collective tasks through a unit training strategy that is tailored to the unit's mission-essential task list (METL), gunnery tables, and the combined arms training strategy (CATS). The training materials include the NET training support packages and TADSS. The battalion S-3 monitors the training; maintains a training log; certifies when each lesson plan in the TSP has been taught; and posts the results of each exam. When the soldier completes Slew-to-Cue training, the S-3 will issue a certificate of training and annotate the soldier's training log, per AR 25-400. Collective training events (live and virtual), combat training center exercises, gunnery training, squad-level to battery-level training all combine to support the standards defined in the Avenger Army Training Evaluation Program (ARTEP), Mission Training Plan (MTP) and Crew Drills. Individual training to support skill level 2 tasks is designed in accordance with the standards identified in the Avenger Soldier Training Publication (STP).

The Avenger CATS will support aerial gunnery qualification with the Stinger missile system and the 50 caliber machine gun. CATS are based upon the building block approach and against the same qualification standards required of all 50 caliber crews. The training approach allows individuals to be trained in basic skills before being integrated into squads. Squads then train progressively from basic tasks through integration as platoon, battery, battalion, or divisional elements performing wartime-missions. Unit commanders have the latitude to integrate the CATS into the training of command and control; and maneuver, survival, and sustainment skills, as they apply to their respective METL.

Gunnery tables provide qualification standards and training strategies and focus on preparing soldiers to qualify and perform as crewmembers. The revised CATS will include the Avenger gunnery strategy with the Avenger crew training outlined in each of the gunnery program. TADSS are used to train on non-qualifying tables. Standards outlined in the MTPs/STPs are the minimum acceptable levels of performance. All Avenger crewmembers will be Stinger MANPADS trained and must qualify on applicable gunnery tables. It is important to note that in order to fully train and evaluate Avenger systems modified for STC, the integration of FAAD C3I component is required. Although this represents significant scheduling challenges at unit level, it is vital that unit trainers ensure this occurs regularly to maintain crew proficiency qualification.

In order to obtain maximum collective training benefit, unit commanders should find ways to maximize Avenger participation at CTC's and with other units (in both live and virtual exercises) on their respective post, especially Signal Units. The PEO/PM is responsible for the development and integration of all TADSS and will fulfill all responsibilities IAW AR 350-38.

7. TRAINING PRODUCTS

TADSS, TSP, and targets for the institution, Combat Training Centers (CTC) and the field must be fielded with the system. Those that cannot must be fielded as soon as technically and economically feasible. The lack of training due to decreased ammunition or TADSS development and distribution will adversely impact the combat readiness of all Avenger units and disqualify those units from participating in combat training center exercises. Overarching resource decrements may adversely impact the strategy in terms of ammunition, targets, and ranges used for gunnery training, ultimately impacting crew qualifications, deployment readiness, and individual soldier skill level advancement.

A complete training subsystem, fielded with the Avenger system, is vital to the overall success of the system. The subsystem should contain a full complement of training support products required to support training of the system in the institution, during NET, and in support of the unit training strategy/Sustainment training. Wherever possible, components will employ embedded training capabilities, be multimedia based, and/or use distance learning technologies. The subsystem will contain (as a minimum) required doctrinal manuals, system technical manuals (preferably Interactive Electronic Technical Manuals (IETM), TADSS, an IMI Training Support Package (TSP), and courses (complete with a digitized POI, lesson plans, student and instructor guides, and a course management plan).

The following further details the training products required to support all aspect of AMT (NET, DTT, and ST):

a. Publications

TM 9-1425-433-10, Guided Missile Battery Control Central, Vehicle Mounted, AN/TWQ-1, Avenger Air Defense Weapon System (currently being revised)
FM 44-44, Digitized Avenger Platoon, Section, and Squad Operations (currently being revised)
ARTEP 44-117-21-MTP, Mission Training Plan for an Avenger Platoon, 10 Jun 92 (under revision)

ARTEP 44-117-21-DRILL, Avenger Drill (currently being revised)
ARTEP 44-117-31-MTP, Mission Training Plan for Avenger Battery, 15 JUN 92 (under revision)
ARTEP 44-413-34-MTP, SHORAD Battery in an ACR and Armor and Mechanized Infantry Brigade, Apr 97, ARTEP 44-177-35 MTP, Linebacker/Avenger Battery (currently under development)
STP 44-14S14-SM-TG, Soldier's Manual and Trainer's Guide MOS 14S Avenger System Crew Member Skill Levels 1, 2, 3, and 4, 17 Aug 96

b. TADSS

The proponent institution and field units require a variety of TADSS to support training. For a detailed matrix of those devices required for gunnery training refer to Section II, ARTEP 44-413-34-MTP. The TADSS matrix in Appendix H of this STRAP further defines TADSS required for support. The following TADSS and targets required to support Avenger operator and/or maintainer institutional and/or unit training:

Institutional Conduct of Fire Trainer (ICOFT) (to be modified for STC)
Captive Flight Trainer (CFT)
Embedded Troop Proficiency Trainer (TPT) (to be developed)
Table Top Trainer (TTT) (to be modified for STC)
Air Defense Combined Arms Tactical Trainer (ADCATT) (to be developed)
Force-on-Force Trainer (FOFT) for home-station and CTC's
1/5 Scale Remotely Piloted Vehicle Target System (RPVTS) w/ancillary devices
Blank Firing Adapters (BFA) 50 caliber machine gun
Radio Controlled Miniature Aerial Targets (RCMATS) (until phased out in FY99)
Cruise Missile Targets (to be developed)
Unmanned Aerial Vehicle Targets (to be developed)
BATS (until phased out in FY00)
Stinger TADSS required for degraded operations training:
- Improved Moving Target Simulator (IMTS)
- Tracking Head Trainer (THT)
- Field Handling Trainer (FHT)
- Stinger Troop Proficiency Trainer (STPT)

Visual Aircraft Recognition (VACR) Kits

c. Multimedia Products

The MATDEV will provide, as a minimum, an IMI TSP similar in detail, function, and quality to that developed for the Bradley ODS vehicle and currently under development for Linebacker. As previously stated it will include self-taught "how to" tutorial modules covering all aspects of the system, especially STC, and a diagnostic test module that permits identification of soldier training proficiency by module. The TSP will be used at the institution, during the course of NET and, in addition to other NET materials, will be left with the unit for future NET/Sustainment Training. Its content may be limited to Avenger-unique (air defense specific, both operator and maintainer) instruction.

d. System Hardware/Software

Tactical Avenger systems (modified for STC) are required to support institutional training at USAADASCH **(28 systems required)** and OMMCS **(10 systems required**). Both institutions will require the full complement of Forward Area Air Defense (FAAD) C3I equipment (as stated in NET Strategy).

8. TRAINING SUPPORT

a. Distance Learning:

The purpose of Army Distance Learning Program is to establish the specific goals, objectives, requirements, and responsibilities for implementing the ADLP across the force. The plan identifies multimedia technologies and communications infrastructure required for Army-wide access to training sources and timelines for phased implementation that will make the program a reality. Appropriate school courses need to be converted to ADLP. Currently USAADASCH is defining and designing the total digitized training strategy.

b. Facilities:

Existing facilities, ranges and real property satisfy Avenger system requirements.

NOTE: Requirements for classroom XXI: **TBD.**

c. Ammunition:

Avenger unit training ammunition requirements equate to 1125 rounds of mixed 50-caliber ammunition per crew, per year. Units will fire Stinger rounds when available. 14S institutional training ammunition requirements are 50 rounds of 50 caliber per student. Each class will fire one Stinger missile (normally top student).

d. Other:

(1) The Avenger system will use targets that are cost efficient and training effective. The targets should be a realistic representation of the threat; duplicate or replicate the time, movement, countermeasures, signatures (including number), exposure times, and hit/kill indications; and provide a feedback/performance scoring capability. With BATS and RCMATS leaving the Army inventory and thermal signature limitations associated with RCMATS, it is imperative that $1/5^{th}$ scale aerial target requirements are met and new targets developed, fielded, and supported to replicate CMs, and UAVs.

(2) It is vitally important that Avengers continue to participate in exercises at CTCs. Participation will be based on the unit's rotational schedule. Every effort should be made to exercise all Avenger system capabilities (to included STC) in live, constructive, and simulated environments. Avengers (to include STC) must be fully integrated into CTC instrumentation. Further investigation is needed to determine if an upgrade to the Combat Training Centers Instrumentation Systems will be required to support Avenger's planned improvements.

9. POST-FIELDING TRAINING EFFECTIVENESS ANALYSIS (PFTEA)

When resources permit and USAADASCH has the manpower to support the PFTEA processes, a PFTEA will be prepared. The process will include coordinating the evaluations of POIs and lesson plans; personnel selection criteria; published exercises (e.g. Situation Training Exercises (STX); NET; TADSS; and any TSP or other training products and material. The New Equipment Training Team (NETT) analysis of demonstrated skills by unit personnel provides initial data for these evaluations. The data

collected by the NETT and the results of the analysis will be staffed throughout the institution. The training departments will use this information to refine and update training programs and requirements.

TARGET AUDIENCE

COURSE MATRIX				
FUNCTIONAL AND PROFESSIONAL	USAADASCH	USAOMMCS	USAQC&SCH	
14B – OBC	X			
C22 – OAC	X			
917A - WOBC		X		
918D –EMMT		X		
14S Avenger Crew Member	X			
27T Avenger System Repairer		X		
63B Light Wheel Vehicle Mechanic			X	

LEGEND	
EMMT	Electronics Missile Maintenance Technician
WOBC	Warrant Officer Basic Course
OBC	Officer Basic Course
OAC	Officer Advanced Course
USAADASCH	United States Army Air Defense Artillery School
USAOMMCS	United States Army Ordnance Missile & Munitions Center and School
USAQC&SCH	United States Army Quartermaster Center and School

ANNEX B

INSTITUTIONAL TRAINING (WARRIOR)

Military Occupational Specialty (MOS) (present data by MOS by school)
Training Strategy for Advanced Individual Training (AIT): 14S
Location: Fort Bliss, Texas
Lesson Plans: 3QFY96 - (Under Revision)
Course Start: 2QFY90
Classes per year: FY 98/34; FY 99/16; FY 00/41
Student load per Fiscal Year (FY): FY 98/1040; FY 99/338; FY 00/903
Analysis Requirements
Training Requirements Analysis System (TRAS) Documents
Individual Training Plan: 3QFY98
Course Administrative Document: 3QFY98
Program of Instruction: 3QFY98
Training Support Required: Refer to Paragraphs 7 and 8 and Annex H
Integrated Training Strategy for SHORAD Officer Courses 14B-OBC; C22-OAC
Location: Fort Bliss, Texas
Lesson Plans: OBC - 1QFY97; OAC - 1QFY97
Course Start: OBC - 2QFY90; OAC - 1QFY90
Classes per year: OBC - FY 98/3; FY 99/3; FY 00/3
Student load per Fiscal Year (FY): FY 98/164; FY 99/157
Classes per year: OAC - FY 98/4; FY 99/4; FY 00/4
Student load per Fiscal Year (FY): OAC - FY 98/134; FY 99/146; FY 00/160
Analysis Requirements
Training Requirements Analysis System (TRAS) Documents
Individual Training Plan: OBC - April 98; OAC November 97
Course Administrative Document: OBC - April 98; OAC November 97
Program of Instruction: OBC - April 98; OAC - April 97
Training Support Required: Refer to Paragraphs 7 and 8 and Annex H

INSTITUTIONAL TRAINING (WARRIOR)

Military Occupational Specialty (MOS) (present data by MOS by school)
Training Strategy for Advanced Individual Training (AIT): 27T
Location: US Army Missile & Munitions Center & School (OMMCS) Redstone Arsenal, Alabama
Lesson Plans: 1QFY97 - (Under Revision); **Expected completion - 1QFY00**
Course Start: 2QFY95
Classes per Fiscal Year: FY 98/16; FY 99/9; FY 00/10
Student load per Fiscal Year (FY): FY 98/105; FY 99/67; FY 00/79
Note: Lesson plans are under revision to incorporate ECU/PPU for Avenger, and 27T tasks for Linebacker.
Analysis Requirements
Training Requirements Analysis System (TRAS) Documents
Individual Training Plan: Jan 98
Course Administrative Document: Jan 98
Program of Instruction: Jan 98
Training Support Required: Refer to Paragraphs 7 and 8 and Annex H
Integrated Training Strategy for the Warrant Officer Basic Course (WOBC) 917A
(With Military Occupation Structure Change Proposal is WOBC 918D - Start Date 1QFY00)
Location: US Army Missile & Munitions Center & School (OMMCS) Redstone Arsenal, Alabama
Lesson Plans: 2QFY95; Under Revision for 918D Course. Estimated Completion: 4QFY99
Course Start: 2QFY95; (MOS 918D Course Start 1QFY00)
Classes per year: FY 98/1; FY 99/1; FY 00/2
Student load per Fiscal Year (FY): FY 98/8; FY 99/8; FY 00/24
Analysis Requirements
Training Requirements Analysis System (TRAS) Documents
Individual Training Plan: ***Currently being Staffed.***
Course Administrative Document: ***Currently being Staffed.***
Program of Instruction: ***Currently being Staffed.***
Training Support Required: Refer to Paragraphs 7 and 8 and Annex H

INSTITUTIONAL TRAINING (WARRIOR)

Military Occupational Specialty (MOS) (present data by MOS by school)
Training Strategy for Advanced Individual Training (AIT): 63B
Location: U.S. Army Training Center, Fort Jackson, SC
Lesson Plans: Jan 98
Course Start: Oct 95
Classes per Fiscal Year: FY 99/62; FY 00/52; FY 01/42
Student load per Fiscal Year: FY 99/3346; FY 00/2880; FY 01/2795
Analysis Requirements
Training Requirements Analysis System (TRAS) Documents
Individual Training Plan: February 98
Course Administrative Data: February 98
Program of Instruction: January 98
Training Support Required: Refer to Paragraphs 7 and 8 and Annex H

UNIT/SUSTAINMENT TRAINING (WARFIGHTER)

1. Individual Training:

a. Strategy: Individual skills will be sustained through daily operational training, crew drills, situational training exercises, field training exercises, and use of the ARTEP Mission Training Plan. Commanders ensure individual proficiency per applicable soldier's manuals; e.g. to maintain individual skill proficiency on the Avenger Air Defense Weapon System, soldiers designated to operate/maintain it will train as follows:

MOS	Training Event	Frequency
14S10	MOS Training	Weekly
14S20	MOS Training	Weekly
14S30	MOS Training	Weekly
14S40	MOS Training	Weekly

b. Products: Required to sustain individual skills.

Product	Required Date	Resource Requirement	Responsible Agency
CATS		In-House	DOTTD, USAADASCH
MTP/Crew Drill	2QFY99	In-House	DOTTD, USAADASCH
Tables			
14S STP	4QFY99	In-House	DOTTD, USAADASCH
27T STP	4QFY98	In-House	USAOMMCS
63B STP	4QFY98	In-House	USAQC&SCH
Operator's TSP	4QFY98	System Contract	Material Developer TRADOC
Maintainer's TSP	4QFY98	System Contract	Material Developer TRADOC
Vehicle TM	3QFY97	System Contract	Material Developer

2. Collective Training:

a. Strategy: The collective skills to employ and maintain the system are learned and sustained through repetitious application of crew drills, STX, command post exercises, and training with the close combat tactical trainer, gunnery, and tactical simulations. ADA doctrine and tactics will be incorporated. Training will be conducted in accordance with the applicable MTP. To sustain collective proficiency, the following are recommended training echelons, events, and frequencies:

Echelon	Event	Frequency
Battalion	Maneuver	
	MAPEX	Annually
	CPX	Quarterly
	STX	Quarterly
	EXEVAL	Annually
	TWET	Annually
	FTX	Annually
	CALFEX	Annually
Battery	Maneuver	
	MAPEX	Annually
	STX	Quarterly

UNIT/SUSTAINMENT TRAINING (WARFIGHTER)

a. Strategy (Continued)

Echelon	Event	Frequency
Battery	Maneuver	
	TWET	Annually
	CAFEX	Annually
	FTX	Semi-Annually
Platoon	Maneuver	
	MAPEX	Annually
	TEWT	Annually
	STX	Quarterly
	LFX	Annually
	FTX	Annually
	DEPEX	Semi-Annually
	EX-EVAL, CTC	Semi-Annually
Section	Maneuver	
	STX	Quarterly
	JTX	Annually
	Gunnery	
	Table IX (CFT, Tactical equipment (IFF, Stinger & Avenger) FHT, Targets w/ancillary devices & MILES)	Quarterly
	Table X (CFT, Tactical equipment (IFF, Stinger & Avenger), Targets w/ancillary devices & MILES)	Quarterly
Squad	Maneuver	
	Train-up (TPT, IMTS, CFT, MILES, Targets w/ancillary devices, FOFT)	
	Drill	Weekly
	MAPEX	Monthly
	LFX	Annually
	Gunnery	
	Table I (TPT, IMTS, & CFT)	Monthly
	Table II (VACR kit, THT, & FHT)	Monthly
	Table III (TPT, IMTS, & CFT, Tactical equipment (IFF, Stinger & Avenger) THT & FHT)	Monthly
	Table IV (TPT & FHT)	Quarterly
	Table V (TPT, IMTS, & CFT, Tactical equip. (IFF, Stinger, & Avenger) THT, FHT, Targets w/ancillary devices, MILES)	Quarterly
	Table VI (CFT, Tactical equip. (IFF, Stinger & Avenger)	Quarterly
	Table VII & VIII (CFT, VACR Kit, Tactical equip. (IFF, Stinger, & Avenger), targets w/ancillary devices, & FHT)	Quarterly

b. Products: Required to support collective training.

Product	Required Date	Resource Documents	Responsible Agency
ARTEP-Crew Drills	4QFY98	In-House	DOTTD, USAADASCH
Gunnery Tables	3QFY97	In-House	DOTTD, USAADASCH
ARTEP-MTP	3QFY97	In-House	DOTTD, USAADASCH
STX		METL	Unit
TSOP		METL	Unit
FM	1QFY96	In-House	DOTTD, USAADASCH
Vehicle TM	3QFY97	System Contract	Material Developer

ANNEX D

TRAINING DEVELOPMENT MILESTONE SCHEDULE

NOTE: Milestones for initial Avenger fielding were all completed prior to FY98. Dates listed indicate milestone revisions based on the STC modification.

Individual Training Plan 14S Avenger Crew Member

Milestone:	Date
1. Initial Individual Training Plan (ITP) submitted.	1QFY00
2. Annotated task list submitted.	2QFY96
3. Course Administrative Data submitted.	1QFY00
4. Training Program Worksheet (TPW) submitted.	1QFY00
5. ITP submitted.	1QFY00
6. POI submitted.	1QFY00
7. Resident course start date.	3QFY00

Army Correspondence Course Program

Milestone:	Date
1. Requirement identified and submitted for approval.	N/A
2. Requirement approved by HQ TRADOC.	N/A
3. Development initiated.	N/A
4. Advance breakdown sheet submitted.	N/A
5. Camera-ready mechanicals submitted.	N/A
6. Subcourse material ready for distribution.	N/A

Army-wide Doctrine and Training Literature Program (ADTLP)

Milestone:	Date
1. Requirements identified.	2QFY96
2. Draft ADTLP changes validated.	TBD
3. Field Manual (FM) outlines approved.	TBD
4. FM coordinating draft completed.	TBD
5. Print request initiated.	TBD
6. Approved camera-ready copies and comprehensive dummy submitted.	TBD
7. Printing and distribution completed.	TBD

Soldiers' Training Publications

Note: Includes the soldiers' manual (SM), Army Training and Evaluation Program (ARTEP), and trainers' guide (TG).

Milestone:	Date
1. Analysis completed.	2QFY97
2. Draft SM, ARTEP, and TG.	2QFY98
3. ATSC staffing.	TBD
4. Camera-ready mechanicals submitted.	TBD
5. Distribution completed.	TBD

TRAINING DEVELOPMENT MILESTONE SCHEDULE
Interactive Multimedia Instruction (IMI)/Distance Learning

Milestone:	Date
1. Requirements identified and submitted for approval.	31 July 98
2. Requirements approved by ATSC & TRADOC.	TBD
3. Identify resources.	TBD
4. Develop and Validate courseware.	TBD
5. Master materials to ATSC for replication and distribution.	TBD
6. Replication and distribution completed.	TBD

Training Effectiveness Analysis (TEA)

Milestone:	Date
1. Interim TEA developed.	N/A
2. TEA updated for Milestone Decision Review I.	N/A
3. TEA updated for Milestone Decision Review II.	N/A
4. TEA updated for Milestone Decision Review III.	N/A
5. Post-Fielding TEA (PFTEA) planned.	N/A

DA Audiovisual Production Program (DAAPP)

Milestone:	Date
1. High-risk tasks and jobs identified.	4QFY97
2. Validated in storyboard.	TBD
3. DAAPP requirements submitted to ATSC.	4QFY97
4. Requirements approved by DA.	4QFY97
5. Production initiated.	TBD

Training Aids, Devices, Simulations, and Simulators (TADSS)

Milestone:	Date
1. High risk, hard-to-train tasks identified.	N/A
2. TADSS concept validated.	NOV 98
3. Need for TADSS identified.	NOV 98
4. TADSS incorporated into the STRAP.	JAN 99
5. Analytical justification via TEA.	N/A
6. Training ORD developed, if required.	N/A
7. TADSS effectiveness validated.	NOV 98
8. TADSS incorporated into the Required Operational Capability (ROC).	N/A
9. MOS-specific milestone/requirements for TADSS developed and incorporated in integrated training strategy (ITS).	NOV 98

Facilities

Milestone:	Date
1. Range and Facility requirements identified.	N/A
2. Construction requirements submitted to MACOM.	N/A
3. Development of construction requirements completed.	N/A
4. Requirements validated and updated.	N/A
5. Supporting requirements identified and availability coordinated.	N/A
6. Installation and other construction requirements submitted to MACOM.	N/A
7. Refined construction requirements and range criteria to MACOM.	N/A
8. Construction initiated.	N/A

TRAINING DEVELOPMENT MILESTONE SCHEDULE
Training Ammunition

Milestone:	**Date**
1. Ammunition identified.	N/A
2. Tentative validation of ammunition requirements.	N/A
3. Requirements included in the ORD.	N/A
4. Ammunition item developed.	N/A
5. Validation and test complete.	N/A
6. Ammunition requirements in the ITP.	N/A
7. Requirements provided to installation/MACOM manager.	N/A
8. Requirements included in DA PAM 350-38	N/A
9. Production.	N/A

ANNEX E

REFERENCES

The following references pertain to the operational testing and subsequent fielding of the Avenger Air Defense Weapon System:

Line-of-Sight Rear (LOS-R) ROC, 1986

System MANPRINT Management Plan (SMMP), 15 SEP 92

Basis of Issue Plan (BOIP) approved: 3/25/92

New Equipment Training Plan (NETP) Number: MIC87094

Army Modernization Information Memorandum (AMIM) Number: 1036

Avenger Slew To Cue Operational Requirements Statement, memorandum dated 17 Jun 96

Avenger Slew To Cue Operational Requirements Statement for Rapid Acquisition dated May 96

TRADOC Approval of Rapid Acquisition Battle Lab Experiment Plans, memo dated 4 Nov 96

COORDINATION SUMMARY

SYSTEM: AVENGER			DATE: 19 October, 1998
	COMMENTS		
AGENCY	SUBMITTED	ACCEPTED	RATIONALE FOR NON-ACCOMMODATION
Commander, 6th BDE	0	0	
Commander, 2-6 ADA	29	27	Information submitted was for different training device.
TRADOC System Manager - SHORAD	0	0	
Director, USAADASCH DCD	6	6	
USAADASCH, Directorate of Resource Management	0	0	
Directorate of Training Management, USAOMMCS	6	6	
Directorate of Training Management, USACASCOM	6	6	
USAADASCH, OCADA	0	0	
Directorate of Training Management, USAOC&S, APG, MD	0	0	
Directorate of Tactics, Training, & Doctrine SHORAD Team	5	5	

ACRONYMS

Acronym	MEANING
AC	Active Component
ACCP	Army Correspondence Course Program
AC/RC	Active and Reserve Components
ACR	Armored Cavalry Regiment
ADA	Air Defense Artillery
ADCATT	Air Defense Combined Arms Tactical Training
AIT	Advanced Individual Training
AMC	United States Army Materiel Command
AMIM	Army Modernization Information Memorandum
ANCOC	Advanced Noncommissioned Officers Course
AOC	Area of Concentration
AR	Army Regulation
ARNG	Army National Guard
ARTEP	Army Training and Evaluation Program
ASI	Additional Skill Identifier
ATLP	Army Training Literature Program
ATP	Acceptance Test Procedure
ATSC	Army Training Support Center
BD	Battle Drill
BLT	Branch Liaison Team
BNCOC	Basic Noncommissioned Officers Course
BOIP	Basis of Issue Plan
CAD	Course Administrative Data
CATS	Combined Arms Training Strategy
CD	Combat Development
CFT	Captive Flight Trainer
CFX	Command Field Exercise
CMT	Command Military Training
COEA	Cost and Operational Effectiveness Analysis
COFT	Conduct of Fire Trainer
CONUS	Continental United States
CPX	Command Post Exercise
CRC	Camera Ready Copies
CRM	Camera Ready Mechanicals
CRMP	Computer Resource Management Plan
CT	Collective Training
CTC	Combat Training Center
CTEA	Cost and Training Effectiveness Analysis
CTLS	Critical Task List
CTT	Common Task Training
CTX	Combined Training Exercise
DA	Department of the Army
DAAPP	Department of the Army Audio Visual Production Program

ACRONYMS

Acronym	MEANING
DAC	Department of the Army Civilian
DAM	Display Aided Maintenance
DCD	Directorate of Combat Developments
DEH	Directorate of Engineering and Housing
DEPEX	Deployment Exercise
DIS	Distributed Interactive Simulation
DTT	Doctrine and Tactics Training
EAC	Enhanced Armored Brigade
EIDS	Electronic Information Delivery System
EOD	Explosive Ordnance Disposal
ESD	Evaluation and Standard Division
ETM	Extension Training Material
ETP	Exportable Training Package
EXEVAL	External Evaluation
FAAD	Forward Area Air Defense
FEA	Front End Analysis
FCX	Fire Coordination Exercise
FHT	Field Handling Trainer
FLIR	Forward Looking Infrared
FM	Field Manual
FOE	Follow-On Evaluation
FOFT	Force on Force Trainer
FORSCOM	United States Army Forces Command
FTX	Field Training Exercise
FUE	First Unit Equipped
FY	Fiscal Year
GPALS	Global Protection Against Limited Strike
GS	General Support
HE	Human Engineering
HMMWV	High-Mobility Multipurpose Wheeled Vehicle
I&KP	Instructor and Key personnel
IAW	In Accordance With
ICOFT	Institutional Conduct of Fire Trainer
ICW	Interactive Courseware
IET	Initial Entry Training
ILSMT	Integrated Logistics Support Management Team
ILSP	Integrated Logistics Support Plan
IPR	In Process Review
ITP	Individual Training Plan
ITS	Integrated Training Schedule
JRTC	Joint Readiness Training Center
JTX	Joint Training Exercise
LCSMM	Life Cycle System Management Model

ACRONYMS

Acronym	MEANING
LOGEX	Logistical Exercise
LRF	Laser Range Finder
LRU	Line Replaceable Unit
LSA	Logistics Support Analysis
LTA	Local Training Area
MACOM	Major Army Command
MANPADS	Man-Portable Air Defense System
MANPRINT	Manpower and Personnel Integration
MAPEX	Map Exercise
MATDEV	Materiel Developer
METL	Mission Essential Task List
MG	Machinegun
MIL-STD	Military Standard
MILES	Multiple Integrated Laser Engagement System
MNS	Mission Needs Statement
MOPP	Mission Oriented Protective Posture
MOS	Military Occupational Specialty
MPTR	Multipurpose Training Range
MQS	Military Qualifications Standards
MQSM	Military Qualifications Standard Manual
MTP	Mission Training Plan
NBC	Nuclear, Biological and Chemical
NDI	Non-Developmental Item
NET	New Equipment Training
NETP	New Equipment Training Plan
NETT	New Equipment Training Team
NMIBT	New Materiel Information Briefing Team
OAC	Officer Advanced Course
OBC	Officer Basic Course
OCADA	Office, Chief of Air Defense Artillery
OCONUS	Outside of Continental United States
OPTEMPO	Operating Tempo
ORD	Operational Requirements Document
OSHA	Occupational Safety and Health Administration/Act
OTRS	Operational test Readiness Statement
PCC	Pre-Command Course
PFTEA	Post Field Training Effectiveness Analysis
PLGR	Precision Lightweight Global Positioning System
PM	Program Manager
PMCS	Preventive Maintenance Checks and Services
POI	Program of Instruction

ACRONYMS	
Acronym	**MEANING**
QQPRI	Qualitative and Quantitative Personnel Requirements Information
RC	Reserve Component
RCMAT	Radio Controlled Miniature Aerial Targets
RCU	Remote Control Unit
RDD	Required Delivery Date
RE	Readiness Exercise
ROC	Required Operational Capability
RPVTS	Remotely Piloted Vehicle Target System
SAT	Systems Approach to Training
SHORAD	Short Range Air Defense
SHTU	Simplified Handheld Terminal Unit
SINCGARS	Single-Channel Ground and Airborne Radio System
SM	Soldiers Manual
SME	Subject Matter Expert
SMMP	System MANPRINT Management Plan
SSI	Sensor System Interface/Special Skill Identifier
STAFFEX	Staff Exercise
STC	Slew-to-Cue
STP	Soldier Training Publication
STRAC	Standards in Training Commission
STRAP	System Training Plan
STOW	Synthetic Theater of War
STX	Situational Training Exercise
SWOC	Senior Warrant Officer Course
TAD	Target Audience Description
TADSS	Training Aids, Devices, Simulations and Simulators
TBD	To Be Determined
TD	Training Development
TDNS	Training Device Needs Statement
TDR	Training Device Requirement
TDS	Training Development Study
TEMP	Training and Evaluation Plan
TEWT	Tactical Exercise Without Troops
TG	Trainers Guide
THT	Tracking Head Trainer
TIA	Training Impact Analysis
TM	Technical Manual
TOC	Tactical Operations Center
TPT	Troop Proficiency Trainer
TPW	Training Program Worksheet
TRAC	TRADOC Analysis Command
TRADOC	Training and Doctrine Command
TRAS	Training Requirement Analysis System
TSM	TRADOC System Manager

ACRONYMS	
Acronym	**MEANING**
TTCP	Training Test Certification Plan
TTSP	Training Test Support Package
USAADASCH	United States Army Air Defense Artillery School
USACAC	United States Army Combined Arms Command
USACASCOM	United States Army Combined Arms Support Command
USAMICOM	United States Army Missile Command
USAOMMCS	United States Army Ordnance Missile and Munitions Center and School
USAR	United States Army Reserve
USASDC	United States Army Strategic Defense Command
USASIGSCH	United States Army Signal School
USALC&FTLEE	United States Army Logistics Center & Fort Lee
USAOC&S	United States Army Ordnance Center & School
USAQC&SCH	United States Army Quartermaster Center and School
USATSC	United States Army Training Support Center
VEDS	Virtual Environment Display System
WOTCC	Warrant Officer Technical Certification Course

ANNEX H

TADSS/ET REQUIREMENTS

a. Purpose

The use of TADSS is a training strategy that reduces costs, and, in general, provides a safe training environment that reserves the tactical equipment for final evaluations or qualifications. The use of training devices permits training to be performed under realistic but simulated conditions while protecting the environment and complementing the requirement to reduce ammunition costs. The limited availability of Stinger rounds and live-fire limitations greatly impacts their use in training and qualification. The use of TADSS allows for the most efficient use of the limited number of Stinger and .50 cal rounds. Therefore, a heavy reliance is placed on the use of TADSS for both training and qualification. The institutional and unit philosophy to train ADA soldiers and leaders as "we fight" is accomplished through the extensive use of TADSS. Successfully achieving and maintaining ADA unit readiness to conduct force protection operations in the combined arms arena using sophisticated ADA tactical systems is a complicated enterprise that is directly tied to the technology that produces training support simulations and devices. State-of-the-art, requirements-based, reliable, deployable, and preferably embedded training devices are needed to ensure soldier proficiency of critical skills.

All the TADSS, Training, and Support materials, products, and equipment addressed in this STRAP are required to support the Avenger force package fielding. The result is a complete training subsystem that supports the Avenger system (to included STC) and meets the needs for all aspects of AMT (NET, DTT, and ST) at the institution, CTCs and units. Every attempt has been made to ensure that TADSS and other training products identified; 1) are user friendly/system compatible, 2) capture/replicate Avenger components/characteristics, 3) are realistic and interactive, 4) take advantage of the latest technology, 5) are deployable/embedded, and 6) provide after-action reporting where applicable. To ensure realization of the TADSS strategy, TADSS and other training product development must be concurrent with the Avenger system development.

b. Overview

The following is an overview of TADSS requirements:

Training Aids, Devices, Simulations, and Simulators (TADSS) Requirements for the AVENGER System				
Purpose/Function	**NET**	**Institution**	**CTC**	**Unit**
Institutional Conduct of Fire Trainer (ICOFT)				
• Crew Operations		**X**		
• Operator Functions		**X**		
• Engagement Operations		**X**		
• Observer Functions		**X**		
• Evaluation Functions		**X**		
• Weapons Firing		**X**		
• Flight Scenarios		**X**		
• CATS		**X**		

TADSS/ET REQUIREMENTS

Purpose/Function	NET	Institution	CTC	Unit
Table Top Trainer (TTT)				
• Operator Functions		**X**		**X**
• Engagement Skills (Missile)		**X**		**X**
• Engagement Skills (Machine Gun)		**X**		**X**
• Simulated Missile Launch		**X**		**X**
• IFF Operations		**X**		**X**
• Crew Evaluation Function		**X**		**X**
Captive Flight Trainer (CFT)				
• Engagement Skills	**X**	**X**	**X**	**X**
• Simulation Missile Launch	**X**	**X**	**X**	**X**
• Operator Tracking	**X**	**X**	**X**	**X**
• Battle Drills	**X**	**X**	**X**	**X**
• Upload/Download Missile	**X**	**X**	**X**	**X**
Force-on-Force Trainer (FOFT)				
• Crew Operations			**X**	**X**
• Engagement Skills (Missile)			**X**	**X**
• Engagement Skills (Machine Gun)			**X**	**X**
• Target Acquisition			**X**	**X**
Air Defense Combined Arms Tactical Trainer (ADCATT)				
• Crew Operations				**X**
• Interactive Simulation				**X**
• Engagement Skills (Missile)				**X**
• Engagement Skills (Machine Gun)				**X**
• Evaluation Functions				**X**
• Tactical Training				**X**
• Force Operations				**X**
• CATS				**X**
Stinger TADSS for degraded operations (IMTS, FHT, THT, STPT)				
• Weapon Handling	**X**	**X**		**X**
• Operator Functions	**X**	**X**		**X**
• Engagement Skills	**X**	**X**		**X**
• Battle Drills	**X**	**X**		**X**
• Operator/Crew Evaluation	**X**	**X**		**X**
TACTICAL EQUIPMENT WITH EMBEDDED TRAINING CAPABILITY				
Troop Proficiency Trainer (TPT)				
• Crew Operations	**X**	**X**	**X**	**X**
• Interactive Simulation	**X**	**X**	**X**	**X**
• Force Operations	**X**	**X**	**X**	**X**
• Engagement Skills	**X**	**X**	**X**	**X**
• Simulation of Tactical Operations	**X**	**X**	**X**	**X**
• Evaluation Functions	**X**	**X**	**X**	**X**
• CATS	**X**	**X**	**X**	**X**

TADSS/ET REQUIREMENTS

c. TADSS Strategy

Required TADSS are addressed in separate subparagraphs. These subparagraphs describe device with respect to the new/desired training capabilities and required characteristics, what it trains and how, where it will be used and by whom, how many are required, and why it is required over some other means.

(1) Institutional Conduct of Fire Trainer (ICOFT)

The ICOFT is a 3D-missile trainer with 6 student stations, 1 instructor station, video display terminals and computer generated battlefield scenarios. The ICOFT possesses the capability to reprogram software/courseware (scenario-generation) for corrections of programs and updating as required. In addition, it possesses AAR capabilities. Future ICOFT development will incorporate Block I and Block II improvements (STC, FBCB2 and BCIS). For additional detailed description and requirements, refer to Appendix 6c, Annex G of the ROC. It trains the functions and operations listed in the table above and will provide for initial training of the skills required to achieve CATS proficiency through the use of its simulated battlefield scenarios. It will be used primarily at the institution in a classroom environment and by initial entry students. A partial system is required at Ft. Hood due the density of Avenger units stationed there and their involvement with Force XXI development. Training experience at the institution has proven that the use of such a device is the best and most cost effective means of conducting the training required.
BOI: USAADAS (3), FT Hood (1/2)
NOTE: Currently fielded but requires upgrade for STC.

(2) Table Top Trainer (TTT)

The TTT is a non-hardened commercial off-the-shelf PC based engagement skills trainer that partially fulfills the TPT requirement. It provides interactive, real time, free play simulation. Scenarios are variable and programmable. It has partial fidelity with real hand controls and sound emulation. It is portable and records operator performance. During a training session, an air scenario is displayed with suitable terrain features on the upper portion of the display monitor, providing the out-of-canopy view. The gunner controls the Avenger turret and weapons, using the hand station to perform target search and engagement exercises. Turret motion in azimuth and elevation is visually displayed by the dynamic out-of-canopy view and by the FLIR display, which appears in the bottom portion of the monitor display. Missile launch, flight, and detonation are displayed on the out-of-canopy view and FLIR display. Appropriate battle sounds, accompany the events of missile spin-up, missile activation, missile uncage, missile launch, machine gun fire, target intercept, and aircraft explosion. For additional detailed description and requirements, refer to Appendix 6a1, Annex G of the ROC. It trains crewmembers in engagement (alert, cue, search, detect, acquire, identify, track and engage) skills through real time and interactive simulation of tactical operations. It will be used at the institution and unit level to the train the tasks indicated in the table above. Institutional training will focus on training initial entry and transition students on entry-level engagement skills. Units will use the device to train-up Avenger crewmen for qualification and sustainment of engagement skills. Training experience at the institution has proven that the use of such a device is the best and most cost effective means of conducting the training required. Increased gunnery scores reported by the field after training with initially produced systems fully supports the institution's findings.
BOI: USAADASCH (5), Unit (1 per platoon); Total requirement is for 94

TADSS/ET REQUIREMENTS

NOTE: 10 prototypes and 47 production devices have been fielded. Currently USAADAS has 1 with the rest fielded to units. There is an unfunded requirement for the remaining 37. Modification for STC is envisioned by FY02.

(3) Captive Flight Trainer (CFT)

The CFT is a simulated missile and missile tube with actual, fully functional seeker. It simulates missile functions/operation when loaded. It simulates most all aspects of the Stinger round during engagements without the need of live rounds. The CFT consists of a Stinger-RMP missile guidance assembly in a ballasted launch tube and container. The seeker and audio interface is the same as for the tactical missile, with electrical power and coolant provided by normal launcher sources. It trains the functions and operations listed in the table above and is primarily used to train operator tracking and engagement skills as well as load/unload and missile handling. The CFT is used in conjunction with aerial targets or live aircraft to train engagement procedures. It is also used with the FOFT to determine simulated enemy kills. The CFT is used both at the institution by initial entry and transition students and at units by all Avenger crewmen. Currently it provides the only means of aerial engagement evaluation but without objective hit/kill confirmation. Training experience at the institution has proven that the use of such a device is the best and most cost effective means of conducting the training required.
BOI: 1 per FU – part of the tactical system buy, all are fielded with the system.

(4) Force-on-Force Trainer

The FOFT simulates the performance capability of the Stinger missile. It is laser-based, represents the field of view of the missile, replicates the range of the missile, provides for "shoot-on-the-move" engagements, tactical simulation of missile, weapons effect signature simulation, and is compatible with the CTC instrumentation of the battlefield with air defense requirements. It will provide the necessary instrumented data listed below to support training at the CTC's

Player ID (platform ID)
Position/Location (GPS)
Weapons Codes (missile/.50 cal) compatible with current and future instrumentation
Weapons Azimuth/Elevation
Missile Activation
Missile Lock
Administrative Resurrect/Kill
IFF (Identification Friend or Foe) Interrogation
Missile Uncaged (Time uncaged to caged)
Trigger pull
Target Range at Trigger Pull
Status (kill, mobility, communications, weapons)
Missile count remaining
The NTC-IS must be able to monitor voice/digital radio traffic.
Record heads-up display sight image/FLIR display image.

It will be capable of Force-On-Force interactive play at HTI, CTC, and deployed training sites by interfacing with TES, CTC-IS, and HTI systems. The FOFT must provide for connectivity to the CTC and HTI-IS, support battlefield simulations, collect date for use in After Action Review (AAR) and

system analysis, and provide necessary battlefield control. It must collect and transmit battlefield simulation data to provide appropriate levels of operator feedback at CTCs, drive C4I systems, and designed to support connectivity to TES and HTI-IS. For additional detailed description and requirements, refer to Appendix 6d, Annex G of the ROC. As indicated, it is used in training the functions and operations listed in the table above through its interconnectivity and feedback capabilities. It will be used primarily at the CTC's but can/and will be used at unit location especially those equipped with some form of HTI by all Avenger crewmembers. Training experience at the institution and CTC's has proven that the use of such a device is the best and most cost effective means of conducting the training required.
BOI: 1 per every 3 tactical systems
NOTE: No new system has been designed. Existing devices are older MILES systems that have been modified for use on Avenger. Current distribution is NTC – 15, JRTC – 9, and CMTC – 6.

(5) Air Defense Combined Arms Tactical Trainer (ADCATT)

ADCATT will be a system of manned Air Defense Artillery simulators, support emulators, and semi-automated forces (SAF) designed to support collective Air Defense training tasks in a combined arms battlefield environment at the mechanized battalion task force level. As with other Air Defense tactical modules, the Avenger modules will be full crew simulated modules that operate and interact on a computer-generated battlefield. The system must accommodate individual crew, as well as, full-size battalion task force training. The device is a computer driven, distributed processing, networked simulation system which provides collective, combined arms training for air defense units on a simulated battlefield, in real time against an array of threats under realistic combat conditions. It will be similar in form and function to the existing Close Combat Tactical Trainers (CCTT) of the Armor and Infantry branches. All ADCATT modules will conform to requirements set forth under Synthetic Environment – Core (SE-Core) documents. As indicated in the table above, ADCATT will be an instrument for executing collective training within the Army's Combined Arms training strategy concept. It will serve as a "gate" through which the unit or individual must pass to reach a progressive level of proficiency in combined arms training. ADCATT supports the training of units to counter the threat facing forward-deployed forces. That threat is expected to be hovering, standoff, masked and running rotary wing aircraft, unarmed aerial vehicles, cruise missiles, leaker fixed-wing aircraft, and enemy ground forces. ADCATT supports leader development and collective training in the Air Defense Artillery and Command and Control mission areas. It provides battle-focused training on "how to fight" ADA weapon systems in a combined arms setting for institutional training and serves as a collective training device for the unit. Training experience at the institution, as well as that at the Armor and Infantry Schools has proven that the use of such a device is the best and most cost effective means of conducting the training required.
BOI: TBD
NOTE: ADCATT, as a program, and the individual system modules are required, but are currently unfunded).

(6) AVENGER Troop Proficiency Trainer (TPT)

The TPT is a strap-on or embedded software and computer system used in conjunction with the tactical equipment at unit level. Its computer will provide visual scene simulation of targets through/out of the canopy and on the FLIR. It will have scenario generation and feedback capabilities. The TPT will be all weather capable for use whenever/where ever the Avenger is deployed. For additional detailed description and requirements, refer to Appendix 6a, Annex G of the ROC. It is envisioned as the objective individual/crew trainer to train the functions and operations listed in the table above. The TPT will be used by the institution to train initial entry and transition students and by the unit to train all Avenger crewmen in advanced skills and sustainment training. It will also be used to evaluate operators. Training

experience at the institution has proven that the use of such a device is the best and most cost effective means of conducting the training required.
BOI: 1 per every 3 FU's (strap-on) or 1 per FU (embedded); USAADAS included
NOTE: Still an open requirement. To date the TPT has not been technically or economically feasible to produce. The TTT is being used as an interim solution fulfilling part of the requirement.

(7) Stinger TADSS for Degraded Operations

As previously outlined in this STRAP, all Avenger crewmen must be Stinger MANPADS qualified in order to continue the Air Defense mission when their Avenger system must operate under a degraded operations mode. Therefore the TADSS associated with the Stinger MANPADS system are required to fully train Avenger Crewmen. These devices are addressed below in an abbreviated form. For a more detailed discussion of each device, refer to the Stinger STRAP, ORD, and other associated Stinger TADSS documents. **The intent for including these devices in this document is to ensure that they are supported and maintained at the levels required to adequately support both systems**.

- Improved Moving Target Simulator (IMTS): The IMTS is a multi-weapon, full-dome simulator for training and evaluation of aerial engagements. It features up to 3 active targets at once and provides high resolution targets for early recognition/identification, user friendly/menu driven software, accurate sound and I.R. signature, plus automated scoring and engagement evaluations. It is designed for fixed site and institutional use.

- Stinger Troop Proficiency Trainer (STPT): The STPT is a portable, scenario driven aerial target engagement trainer. It provides gunnery sustainment training in garrison and in the field utilizing a common instructor station linked to a video screen on the gunner's weapon. It generates digitized targets and background onto the weapon system's optics and is used to train weapon system operations, target acquisition, tracking and engagement. The system has indoor and limited outdoor capability and fully supports after-action review/mission rehearsal. The currently fielded device suffers from obsolescence but a new prototype device has been developed that is more flexible, efficient, and state-of-the-art. It will replace and exceed the capabilities of the IMTS. The STPT is used both at the institution and at unit level.

- Tracking Head Trainer (THT): The THT is used to train the Stinger gunner in the techniques of acquiring, tracking, and engaging targets. It consists of a weighted launch tube with seeker, a simulated IFF, and NICAD batteries for power. The simulated IFF provides a random friend/foe/unknown audio signal. The seeker allows the gunner to lock on to live targets and electronics mounted on the tube indicate if the engagement sequence was done correctly. This device is also used in conjunction with the IMTS. The THT is used both at the institution and at unit level.

- Field Handling Trainer (FHT): The FHT consists of a dummy gripstock, IFF and launch tube. It simulates the weight, size, and controls of an actual Stinger though there are no internal parts or electronics. It provides for practice in the basic skills of weapon handling and engagement battle drills. The FHT is used both at the institution and at unit level.

(8) Aerial Targets

In addition the system TADSS identified above, air defense systems, to included Avenger, require specific (aerial) targets. Target needs are based on and must replicate the threat expected both now and in

the future. These targets will be used at the institution, CTCs, and at unit home-station by students, MOS qualified soldiers, and crews. At the institution, they will be used for target tracking and target engagement. Each graduating class (normally top student) will fire one missile at an aerial target. Units will use aerial targets for tracking/engagements in conjunction with gunnery. In addition, they will be used in conjunction with combined arms, maneuver, and other collective training events. The use of such targets is far more cost effective and provides greater availability than having to rely on live targets of opportunity or coordinating for the flight of Army/Air Force aviation assets. Aerial targets will most often be used with other training devices, such as; FOFT, CFT & PGS and must be capable of providing engagement feedback. With RCMATS and BATS being phased out of Army inventories, and no other suitable target available, it is imperative that 1/5th scale aerial target requirements are met. With the shift in the threat's use of CMs and UAVs over manned aircraft, it is vital that new targets be developed and fielded. Listed below are descriptions of aerial target needs.

BOI: The number and types of targets required will fluctuate based on mission/exercise requirements. The availability/scheduling of existing targets must be programmed through the unit training plan and supported by the Targets Management Office, STRICOM. Support of the RPVTS 1/5th scale target at the institution, unit and CMTC's is based on total mission requirements per year. The 1/5th scale targets are required to support TADSS, gunnery, and live fire exercises. For FY99 the total number of 1/5th scale targets needed to support this training is 610, based on 30 missions flown. Currently this is strictly a requirement for the .50 caliber machine gun. With BATS leaving the inventory this requirement will increase by at least, an additional 300-500 1/5th scale targets for live missile firings per year. This requirement includes both active and reserve forces. As additional ARNG units activate, this requirement will increase to approximately 50 targets per unit per year.

- 1/5th Scale Remotely Piloted Vehicle Target System (RPVTS): Consists of two configurations, the SU-25 "FROGFOOT", a propeller driven, highly maneuverable, fixed wing target, and the MI-24 HIND-D Gyrocopter, a replica of the threat aircraft of the same name. The MI-24 is also propeller driven with a rotor providing limited lift and a helicopter appearance in flight. These target types can be configured to support various training scenarios using ancillary devices attached to the body of the airframe which are:
    a. PGS Retro Reflectors can be attached to the airframe for use with the Precision Gunnery System (PGS) which provides a non-destructive means to engage the target and receive realistic, real time feedback regarding gunnery hit or miss.
    b. The scoring system consists of a device which is installed on the 1/5th Scale targets, and a ground station which provides a real time readout of hits on target and miss distance indication of rounds penetrating an electronic field around the target. Data telemetry to the ground station permits real time feedback.
    c. Infrared Pods can be attached to the targets to provide an enhanced IR signature for use with weapons systems equipped with IR seeker technology.
    d. The Multiple Integrated Laser Engagement System (MILES) is a device similar in some respects to the PGS system in that it is a non-destructive system for simulation engagements.

- Ancillary Device Scoring: Electronic scoring, bullet counting or missile miss distance, provides an objective near-real time means of evaluating gunner or weapon system performance. Immediate feedback in hard copy is provided for After Action Reviews. Scoring devices are tailored to the target and the mission being supported, and are available for pop up ground targets, full-scale and sub-scale fixed wing targets, various towed targets.

TADSS/ET REQUIREMENTS

- Cruise Missile Targets: CM targets must be developed and fielded that replicate the current and projected flight profiles and radar cross-sections of cruise missiles. They must be recoverable/reusable and possess engagement feedback capabilities. As this threat evolves, these targets will be introduced into not only gunnery but training exercises as well.
- Unmanned Aerial Vehicle Targets: UAV targets must be developed and fielded that replicate the current and projected flight profiles and radar cross-sections of various UAVs. They must be recoverable/reusable and possess engagement feedback capabilities. As this threat evolves, these targets will also be introduced into not only gunnery but training exercises as well.

d. Data Sources

Tasks to be trained were derived from the training proponent's review of the MATDEV's Logistical Support Analysis (LSA) data and evaluation/validation of procedures on prototype systems. The types and number of TADSS required are a result of the training proponent's estimates based on the training analysis of this system, MATDEV input, PFTEAs on predecessor/similar systems, input from the US Army Simulation, Training, and Instrumentation Command (STRICOM) and the US Army Training Support Command (ATSC).

e. Types of TADSS

Many types of TADSS were considered for inclusion in the development of this strategy. Though individual devices for each type were not deemed necessary. Those selected above fully cover the training requirements. The types of TADSS considered are as follows:

Gunnery Trainers
Maneuver Trainers
Maintenance Trainers
Force-on-Force Trainers
Simulations
    Crew
    Functional
    Force-Level
Equipment/Component Simulators
Basic Skills Trainers
Part/Task Trainers
Drivers Trainers
Embedded Trainers
    Operator
    Crew
    Functional
    Force-Level

f. Embedded Training

Embedded training was considered for Avenger and efforts are ongoing to incorporate more embedded training as well as virtual training as the system matures. Embedded training for the Avenger system consists of the TPT as described in paragraph c.6 above. It, in its objective form, will be a fully embedded trainer for both operator and crew level tasks.